REMARKS

The foregoing amendment amends claims 2, 5 and 6 for purposes of clarity, cancels claims 3 and 4, and adds claims 11-13. Pending in the application are claims 1, 2, 5-8 and 10-13, of which claims 1 and 6 are independent. The following comments address all stated grounds for rejection and place the presently pending claims, as identified above, in condition for allowance. *No new matter is added.*

Amendment and cancellation of the claims are not to be construed as an acquiescence to any of the objections/rejections set forth in the instant Office Action, and were done solely to expedite prosecution of the application. Applicants reserve the right to pursue the claims as originally filed, or similar claims, in this or one or more subsequent patent applications.

35 U.S.C. 112 Rejections

Applicant thanks the Examiner for the close review of the claims and for indicating that claims 4 and 5 recite patentable subject matter. Regarding the rejection of claims 2-5 under 35 U.S.C. 112, second paragraph as being indefinite, Applicants have amended claims 2 and 5 to clarify the subject matter claimed. Specifically, claim 2 is amended to recite a specific feature of the voltage follower. Claim 5 is amended to clarify that the output of the integrating circuit is fed to the voltage follower and *applied to* the working electrode. Claims 3 and 4 have been canceled and the subject matter of claims 3 and 4 has been recast in new claims 12 and 13, which Applicants submit are clear and definite.

35 U.S.C. 102 Rejections

Applicant respectfully traverses the rejection of claims 1-3 under 35 U.S.C. 102(b) as being anticipated by Frenck (U.S. Patent Number 3,788,962) and the rejection of claim 6 under 35 U.S.C. 102(b) as being anticipated by Weisstuch et al. (U.S. Patent Number 3,716,460).

Claim 1 recites a corrosion monitor, comprising a substantially inert reference electrode, a working electrode composed of a material to be monitored, and a voltage

follower adapted to apply a voltage between the electrodes. The voltage applied by the voltage follower reflects previous values of a current flowing between electrodes. As clearly described in the specification and shown in the Figures, an ammeter, or other device, measures the current flowing between the electrodes and produces a signal that reflects the current. The signal that reflects the current is fed to an input of the voltage follower to complete a feedback loop, such that the output of the voltage follower reflects a previous current valve. In one embodiment, the signal representative of the current is fed to an integrating circuit prior to passing to the voltage follower. The integrating circuit integrates the signal and feeds the integrated signal to the voltage follower.

It is Applicant's position that the claim language reciting that the voltage follower applies a voltage that reflects the previous values of the current flowing between the electrodes carries patentable weight. The recitation is a positive, structural limitation on the voltage follower. The application of a voltage reflecting previous values of a current results in a structural difference between the claimed invention and the prior art and serves to limit the claim, for example, by necessitating that a signal reflecting the current between the electrodes be passed as an input to the voltage follower. A voltage follower whose output depends upon depends upon a previous current value between a working electrode and a reference electrode is not found or suggested in the cited prior art.

The Frenck reference is directed to a device for monitoring the rate of corrosion that includes three metal electrodes 1, 2, 3 forming a test probe. The potential, relative to ground, of a freely corroding reference electrode 3, though which no current is passed, is fed to an operational amplifier 9, and the output of the operational amplifier 9 is applied to the "power" electrode 2. In Frenck, the summing amplifier 9 simply takes a *current* value representing the difference between the potential at the reference electrode 3 and the specimen electrode 1 and applies the potential to a third (and separate) power electrode 2.

When an appreciable current flows between the power electrode and the specimen electrode 1, a functional voltage arises. The amplifier 12 within the current

reduction means 13 inverts the signal representing the functional voltage, and amplifiers 6 and 14 buffer the signal. Thus, the effect will be to feed into junction 8 the reference electrode 3 potential "plus" the inverted specimen electrode 1 potential, i.e. the difference between the reference and specimen electrode potentials.

agree but not claimed

The Frenck device does not retain historical information regarding the current between the two electrodes, and therefore a voltage applied by a voltage follower does not reflect *previous* values of a current between the electrodes, as recited in claim 1. Because the amplifier 9 of Frenck reflects current values of the voltage difference between the electrodes, rather than *previous* values of the current flowing between the electrodes, claim 1 defines over the Frenck reference. Furthermore, as described above, the amplifier 9 of Frenck applies a voltage to a separate third electrode, i.e., the power electrode 2, and does not apply a voltage difference between a reference electrode and a working electrode (i.e., the specimen electrode), as recited in claim 1.

The Frenck reference would require substantial redesign to apply a voltage between two electrodes that reflects previous values of a current flowing between the two electrodes. Frenck teaches away from the claimed invention, because in the arrangement described in Frenck could not be modified and still operate. For example, the arrangement described in Frenck is essential so that the input 15 from the polarization equipment applies an occasionally varying signal in order to see the effect of the signal. The corrosion monitor described in the present application utilizes an alternative digital means for applying such a polarization signal, which makes the arrangement in Frenck unnecessary. Therefore, claim 1 and claims 2, 5 and 11-13, which depend from claim 1, are patentable over the Frenck reference.

Regarding the rejection of claim 6, Applicants have amended claim 6 to clarify that that the electronic circuitry actively monitors AC current noise, as described on page 3, first full paragraph and page 7, third full paragraph. The Weisstuch reference describes a capacitor 138 that blocks DC current while allowing naturally occurring AC current noise when a switch 122 is in a lower position, as shown in Figure 6. However, the Weisstuch reference does not teach or suggest *monitoring* of the AC current noise, as recited in claim 6. The Weisstuch reference

does not anticipate claim 6, because Weisstuch does not teach or suggest a corrosion monitor, comprising a pair of electrodes and electronic circuitry that monitors naturally occurring AC current noise by blocking DC current flowing between the electrodes, while allowing any naturally occurring AC current noise to flow unhindered.

35 U.S.C. 103 Rejections

Applicants respectfully traverse the rejection of claims 1-3, 7, 8 and 10 under 35 U.S.C 103(a) as being obvious over Weisstuch in view of Jovancicevic (U.S. Patent Number 6,280,603) and the rejection of claim 10 as being unpatentable over Frenck in view of Jovancicevic.

Even in combination, the Weisstuch and Jovancicevic references fail to anticipate claims 1-3, 7, 8 and 10. Neither reference teaches or suggests a corrosion monitor including a voltage follower that applies a voltage between an inert electrode and a working electrode, which reflects previous values of the current flowing between the inert electrode and the working electrode, as recited in claim 1. Regarding the recitation that the voltage applied by the voltage follower reflects previous values of the current between the electrodes, Applicants submit that this recitation is a positive, definite limitation on the structure of the voltage follower by necessitating that an input to the voltage follower be connect to a signal reflecting the current between the electrodes.

As shown in Figure 2 of Weisstuch, electrode 114 is isolated when the switches 122 and 128 are in the position shown in Figure 2. The difference in potential between electrodes 110 and 112 is fed to a capacitor 138, which stores a corresponding charge. Once quiescent, the circuit is placed in to an alternative mode by moving both switches 122 and 128 out of the positions shown in Figure 2. The capacitor 138 is then isolated from the electrode 112, and the capacitor 138 preserves the voltage difference previously present between the electrodes. As electrode 110 is unearthed, the capacitor 138 retains the previous absolute potential of the electrode 112. The previous absolute potential is fed through the voltage follower 118 which ensures that the voltage is readable without dissipating the charge on the capacitor

138. The amplifier 120 is then fed with that preserved voltage and the current voltage on the electrode 112. The amplifier provides an output current via a meter 124 and a resistor 126 to a separate third electrode 114. That current can be measured either via the ammeter 124 or via the potential difference across the resistor 126. The measured current gives information regarding the current corrosion state.

The system described in Weisstuch differs fundamentally from the corrosion monitor of the claimed invention. The system of Weisstuch measures a historic galvanic potential between two electrodes and preserves the galvanic potential in the form of a memory on the capacitor 138. The difference between the instantaneous potential and the historic potential is then used to determine a current, which is applied to a separate third electrode. The injection of charge into the solution by that third electrode will (by other processes) affect the current voltage at the electrodes, but the circuit disclosed requires the presence of the separate third electrode.

The Weisstuch reference describes a system that applies a current between two electrodes that depends on a previous voltage between a different pair of electrodes. In contrast, claim 1 recites a voltage follower that applies a voltage between an inert electrode and a working electrode, which reflects previous values of the current flowing between the inert electrode and the working electrode, not between a different pair of electrodes.

Furthermore, as recognized by the Examiner the Weisstuch reference does not describe an inert reference electrode, as recited in claim 1. According to the Examiner, because the Jovancicevic reference describes a corrosion meter including a reference electrode constructed of an inert material, it would be obvious to modify the corrosion rate meter system of Weisstuch to include an inert reference electrode. However, there is no motivation to modify the system of Weisstuch to include a reference electrode made of an inert material, though even in combination, the references fail to anticipate the claimed invention.

Because the configuration described in Weisstuch is fundamental to the operation and design of the corrosion rate meter system, it would not be obvious or

desirable to modify the system of Weisstuch to include a voltage follower that applies a voltage between an inert electrode and a working electrode that reflects previous values of the current flowing between the inert electrode and the working electrode, or a reference electrode comprising an inert material.

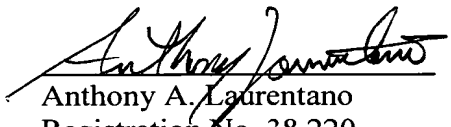
Because independent claims 1 and 6 are patentable over the cited prior art, dependent claims 2, 5, 7, 8 and 10-13 are also patentable. Furthermore, the dependent claims recite additional patentable features. For example, claims 5, 11 and 13 positively recite an integrating circuit for integrating a current flowing between the electrodes, a feature neither taught, nor suggested in the cited prior art.

CONCLUSION

For these reasons, Applicants contend that claims 1, 2, 5-8 and 10-13 are patentable and that the claims are clear and definite. As such, the Examiner's objections and rejections so far as they are based upon 35 U.S.C. §112, 35 U.S.C. §102 and 35 U.S.C. §103 should be reconsidered and withdrawn. Allowance of the pending claims at an early date is solicited.

If, however, the Examiner considers that obstacles to allowance of these claims persist, we invite a telephone call to Applicants' representative.

Respectfully submitted,
LAHIVE & COCKFIELD, LLP



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